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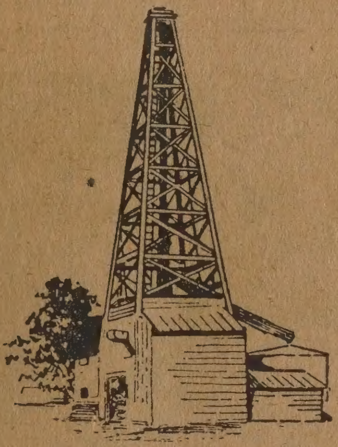
OFFICIAL

Report and Minutes of the

FIRST ANNUAL CONVENTION

MONTANA CHAPTER OF THE

ROCKY MOUNTAIN OIL & GAS ASSOCIATION



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DECEMBER 4-5, 1925

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SPEAKERS PROGRAM

Friday Morning

1. A. Judson Findley, President's Address.

2. J. R. Reeve, Associate Engineer,, U.S.G.S., "Oil Development and Water Problems in Montana."

3. A. H. Sikes, General Manager Great Falls Gas Co., "Montana's Natural Gas".

Friday Afternoon

1. Frank Scotten, General Manager, Montana Power Co., "Electrification of Kevin-Sunburst field."

2. H. C. Fowler, Safety Engineer, Bureau of Mines, "Safety in the Petroleum Industry." (Paper read by E. A. Hanson, U.S.G.S.)

3. Honorable J. E. Erickson, Governor of Montana, "Montana"

Saturday Morning

1. Wm. B. Findlay, C. P. A., "Oil Producers' Accounts and Taxation."

2. H. Earl Clack, Pres. H. Earl Clack company, "The Montana Oil Marketer."

3. Dorsey Hager, petroleum geologist, "The Search for New Oil Fields in North Western United States."

Saturday Afternoon

1. E. F. Flynn, Vice President and General Counsel Great Northern Railway, "The Railroads' Contribution to the Petroleum Industry."

2. C. A. Rasmusson, Collector Internal Revenue, "The New Income Tax."

3. Honorable B. B. Brooks, Former Governor of Wyoming, "How Oil Development Effected our Neighbor in Wyoming."

4. Frank R. Venable, Secretary Butte Chamber of Commerce, "The Pacific Northwest Commercial Industrial Exposition."

OFFICERS

Committee on Resolutions: M. O. Danford, O. I. DeSchon, C. H. Brown, J. H. Stevenson, Guy Craig.

Committee on Nominations: A. E. O'Brien, M. C. Henderson, James A. Johnson, Harry Adams, L. L. Bechtel, C. W. Hart, Kenneth Christie.

Committee on Organization: E. B. Coolidge, C. W. Buntin, S. C. Ferdig, William Rice, John O'Neil, La Rue Smith.

On recommendation of the committee on Organization the Association amended the by-laws to read: "That the annual meeting of the association shall be held at such time and place as shall be designated by the Board of Directors." The number of directors was changed from nine to 12, to include at least three each from the producers, refiners and marketers. Seven constitutes a quorum.

The committee on Nominations recommended the election of the following directors:

Producers: E. B. Coolidge, Homestake Oil Co.; Donald Campbell, Mid-Northern Oil Co.; A. Judson Findley, Western Petroleum Exploration Co.

Refiners: L. B. O'Neil, International Refining Co.; A. E. O'Brien, Lewistown Oil & Refining Co.; M. C. Henderson, Sunburst Refining Co.

E. B. Coolidge.

Mr. Coolidge was elected president of the Montana Chapter of the Rocky Mountain Oil & Gas Association. He was the chairman of the organization meeting of the chapter and has been prominent in association activities during the past year. He organized and is now president of the Homestake Oil company.

Marketers: C. H. Brown, Arro Oil & Refining Co.; C. W. Landsrud, Continental Oil Co.; H. Earl Clack, H. Earl Clack Co.; Henry Sample, Hughes Oil Co.; R. J. Coughlin, Westland Oil Co.

Publicity: O. I. DeSchon, Montana Oil Journal.

The Committee on Resolutions recommended resolutions:

"That this association recommend and advocate that the statutes of the state be so amended as to provide that all such tax moneys levied and collected in the future be expended on the highways of the state. Appreciating that the State of Montana is now receiving, and probably in the future will continue to receive large sums of money as Royalty from production secured from state lands that any emergency that heretofor may have existed in special funds no longer exists and no burden or hardship upon the taxpayers shall be incurred by the diverting of any special or sales tax upon gasoline to the highways of the state."

—Also that "this association command and approve of the action of all executives, both national and local, in their efforts to reduce expenditures to the relief of the tax payers and incidental with good government."

—And Also thanked the local committee and people of Great Falls for the generous hospitality and entertainment.

1925

GRAVE PROBLEMS CONFRONT MONTANA OIL INDUSTRY, RETIRING PRESIDENT STATES IN ANNUAL ADDRESS TO THE ASSOCIATION

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A. Judson Findley, retiring president of the Montana Chapter of the Rocky Mountain Oil & Gas association, pointed out to oil men of Montana the necessity of co-operation in the oil industry for mutual protection and for profitable operation of the various branches. Mr. Findley has been one of the leading figures in the Association since its inception and his annual address showed the result of careful analysis and study of the problems at hand in Montana, of interest to every person engaged in the oil business.

He said, in part:

I have chosen as my subject for discussion "The Necessity of Organization and Cooperation in the Oil and Gas Industry." You business men, who support this or any other organization with your time, labor, money or your companies' money should ask the question "Does it pay," not necessarily directly or not necessarily in dollars and cents, but does it pay directly or indirectly in the short or long pull in promoting the industry?

There is an economic benefit to the oil and gas industry from organization and cooperation within the same.

1. Through the assembling, analysis and diffusion of trade information.
2. By the betterment of public relations.
3. By providing facilities for working out a forward looking program.
4. By providing a plan for group action against the enactment of unfair and unjust legislation.

Hazards Of Industry.

The hazard attending the oil and gas industry makes more imperative organization and cooperation within the same.

The distance between stars and suns can be determined with mathematical accuracy; the ocean's depth can be sounded, the cost of an ocean steamer circumnavigating the globe can be estimated; the thousands of tons of coal in the hills can be figured; the crops on a million acres can be forecasted, but who is there that can determine, sound, approximate, figure or forecast the results of a finiancial undertaking in drilling a wildcat well at a cost of from twenty five thousand to two hundred thousand dollars. Some one has figured that 24 percent of all wells completed are dry, 85 percent of wildcat wells are dry. Even in proven fields, who of you can forecast the results of your venture. 4779 leases were tested with the drill in Kansas, Oklahoma, Texas, Lou[illegible]iana and Arkansas in 1923. The percentage of dry holes was 49.8.

Growing Costs.

In 1883 the average cost of drilling wells was around $2800.00; in 1923 the average cost was $24,438. How many of you men have gone out in the morning with steps full of spring and hearts joyous to see the drill go through the caprock and touch the "liquid gold," only to return at evening with hanging head and lips closed in silence because half of your fortune was ventured in the futile effort. How many of you have seen your friends accumulate a nice little sum sufficient for old age and then lose it in what they thought a sure thing. But once you have had the "golden touch" the hazzard continues. You begin at once to deplete and remove your property and you cannot forecast the day or the year when your work is completed. Today your market is good, tomorrow it is shot to pieces but the lifting costs remain the same.

A Cooperative Industry.

Organization and cooperation are the means of diffusing the facts of the industry.

The greatest factor of success in the industry has been and will be the interchange of information gained from the daily operations and experience of the industry. It is this necessity, that has practically barred trade secrets from the industry. Do you men know any trade secrets in the developing and operating end of the industry?

How many of you men operating in the Kevin-Sunburst field have gone to brother Lee Yealey, a Nestor of the game, for counsel on your problems? Did he not give you his experience, his theories, tried and untried, his plans, his best results and best methods as freley as you asked for the same? Notwithstanding his thirty-seven or more years of experience in development and production work for the Ohio Oil Company, but a few days ago he said to me "I like to talk with the youngest operator because I learn something from him." A few years ago, it was not uncommon to see barbed wire entanglements around a drilling well, but experience soon taught that this method shut out more information than it shut in.

In Oklohoma at this time no one company undertakes to scout the entire state or even an entire district. The scouts of different companies divide and interchange territories from week to week. On a certain day or evening all the scouts get together and exchange information and that information becomes the property of all the companies having scouts. Cooperation is the practice. Efficiency and economy is not the the problem of one individual, it is the problem of all.

A. JUDSON FINDLEY

Retiring president of the Montana chapter, who was elected vice president, heading the Producers Group of the association. Mr. Findley is vice president and manager of the Western Petroleum Exploration company in Montana.

The greatest needs of the hour in the industry are the facts of the industry properly assembled, analyzed, coordinated, disseminated, and interchanged.

The theories proven false or true; information worked out by the geologist, petroleum, chemi[illegible]al, or mechanical engineer; experiences of the superintendent, foreman, driller and pumper; facts disclosed by proper accounting methods; problems solved and to be solved by the transporter, refiner and marketer; all these agencies and not any one individual or company, possess the "master key" to the success of the industry. But their information and experience are but partially serviceable unless it is assembled, classified, analyzed and interchanged. It is this work that is the function of the many oil and gas organizations, trade journals, institutes, chambers of trade and government agencies.

Improved Methods.

In 1909 there was extracted from the average barrel of oil 10.7 percent gasoline, in 1923, 30 percent; in 1909, 33 percent was kerosene, in 1928, 9.6 percent. In 1909 there were but 311,000 motor cars and trucks, in 1924, 17,591, 991. In 1924 there were produced in the United States 8,960,000,000 gallons of gasoline to

GRAVE PROBLEMS CONFRONT MONTANA OIL

meet the requirements of the increased motor industry. These developments are not the result of accident nor the work of any one individual or company, but have come about by assembling, analysis and use of all the information gleaned from the industry. Dr. Rittman of the Bureau of Mines proclaimed that oil is made up of molecules, the smaller ones being gasoline and the larger ones, according to their size, kerosene, fuel oil, tar, etc., that after the gasoline molecules are removed, the next large one can, by heat and prssure, be broken up into other gasoline molecules and the still larger ones cracked into kerosene, fuel oil, etc. This was a new idea and its diffusion has led to the many processes of cracking oil. that have multiplied the percentage of recovery of gasoline and other products in a barrel of oil to meet the growing demands of commerce. Dr. A. C White of West Virginia proclaimed the anticlinal theory of oil accumulation. The diffusion of this fact has greatly reduced the hazzard of wildcatting. Someone stated that in the United States there are about two billion acres of land, and that oil and gas has been produced on about two million acres. On the acreage basis the chances for success in wildcatting would be at the ratio of about one to one thousand.

An enumeration of some of the other fields of activity for an organization aids in showing its economic utility to the industry.

Any problem that can be handled better by the group than the individual is a problem for the organization.

The problems that can better be handled by the group than the individual multiply in many many directions, such as, correction of matters of trade practices and predatory competition, correction of unfair conditions, promotion of justice and fairness in business transactions, the building up of public relations, (one of the imperative needs of the hour), securing relief in matters of taxation, acting as a sentinel in matters of legislation, securing remedial legislation, (one of the particular needs in this state); and many other matters wherein the Association can represent the interest of the members with greater effect than is possible through individual effort. Many of the associations have many departments, highly paid technologists in different engineering work; statisticians, paid lawyers or other men working on problems for the common good of their membership.

Montana Problems

Your Chapter in its brief existence has had before it various problems such as unfair trade practices, matters of taxations wreckless abandonment of wells, issues to be litigated in the interest of the fraternity, matters of public relations and subjects for remedial legislative action.

The Board of Equalization of your state are having to apply metalliferous mining tax laws to the oil and gas industry. The Chapter has represented you on different occasions before the Board of Equalization to secure for you equitable rulings and proper regulations under these laws. I mention an instance where the Board required you to report your net proceeds tax on the basis that each oil well constitutes a mine. Had not this requirement been changed, the operator would have to handle each well as a unit instead of groups of wells on the lease, and done so at great expense. The final requirement of the Board was that each leasehold or part of leasehold under one management and operation might be treated as a mine for net proceeds tax purposes.

C. H. "CHERRY" BROWN

Mr. Brown was elected to the important office of vice president, in charge of the Marketers' Group. Mr. Brown was the moving spirit in the Independent association, which the Montana Chapter superseded. "Cherry" is NOT a cowboy but he looks so much like Bill Hart that his friends had him pose for this picture to prove the resemblence. He is vice-president of the Arro Oil & Refining company.

The Board of Equalization has ruled that the payment of royalties on a leasehold cannot be treated as an item of cost in reporting the net proceeds of the lease for purpose of taxation. The Chapter is now working on this problem.

Many complaints were made by operators of improper plugging of wells being abandoned and of failure to protect producing or bearing sands against water encroachments. Your committee on conservation of oil and gas has worked out and submitted to the Board of Railroad Commissioners of the State of Montana, the state's agency for handling these matters, proper regulations relating to the same.

Public Must Be Informed.

There is great necessity of organization and cooperation for betterment of public relations and for providing an agency for group action against the enactment of unfair and unjust legislation.

On this fact I shall comment briefly for the necessity will be shown by other discussions in this meeting. But one of the urgent needs of the hour is a correct knowledge by the public of the facts of the industry, such as the hazard of the same, its profits and losses, its fair dealing, its contribution to progress and civilization and its part in the support and maintainance of the government.

The public should know that in January 1924, 266,569 wells were making an average of but 6.64 barrels per well; that 82 percent of this number produced an average of but .79 barrels, that approximately $91,410,000 was spent drilling dry holes in the year 1924; that in 1923 there were drilled 24,438 wells at an estimated cost of $515,704,000; that in 1924 there were 41,497 miles of trunk pipelines, 41,335 miles of gathering lines, 478 tank vessels of American registry, many thousands tank cars, 547 completed refineries; an investment in the industry approximately $8,020,000,000; that in 1924 approximately $75,834,470 gasoline tax was paid; that a survey shows 750,000 employees engaged in the industry and about 4,000,000 people supported by it. I have never seen an estimate of total taxes paid by the industry, but there is no question it is bearing its undue share of taxation. If the public only knew the facts about the industry, those engaged in it and the good people of the country would not permit the same to be the constant object of attack by demagogues, politicians and self seeking newspapers.

Ask Fairness Only

It is the duty and function of organizations, trade journals, bureaus and other agencies to carry the facts to Garcia and to defend the industry against hostile and unjust legislation and to secure for it the same protection and opportunity that are accorded other industries.

This convention and work of this Chapter will pay many times if it can drive home the one idea that cooperation is the "master key" to the success of the industry. Great advancements that have been from the days of the savage to our present day civilization, has been accomplished or made possible by some form of cooperation. Every human effort, be it work or play, is successful in direct proportion to the length and strength of the collective effort behind it. Cooperation is one of the few things that cost but little but pays big dividends. It is that thing invisable to some of us, but available to all; that opens many seemingly closed doors; makes for the diffusion of knowledge; removes friction and misundertanding; makes for better fellowship and best of all makes us better employees, better employers and better citizens.

GOVERNOR ERICKSON HONORS OIL MEN BY PRESENCE AT MEET

The Montana Chapter has as its honor guest Governor J. E. Erickson of the State of Montana. Governor Erickson spoke at the opening session on "Montana", giving official welcome to the representatives of Montana's youngest and most promising industry: the oil business.

OPERATING CONDITIONS IN KEVIN-SUNBURST FIELD DISCUSSED BY U. S. G. S. MAN-GIVES VALUABLE SUGGESTIONS TO FIELD OPERATORS

A comprehensive treatise on operating conditions in Kevin-Sunburst field was given by J. R. Reeve, associate petroleum engineer of the United States Geological Survey before the Montana Chapter of the Rocky Mountain Oil & Gas association... He announced that the Survey is contemplating a uniform casing method to protect sands from water invasion. He said, in part:

The following discussion is based chiefly on conditions as found on Government leases and permits, but these conditions can probably be taken as typical of the entire Kevin-Sunburst field.

The factors governing production in this field are not fully understood. We have the condition here that an offset to a small producer or dry hole may come in for big production and many locations which have been reasonably expected to yield good wells have proven to be small producers or dry. This condition of uncertainty appeals to the gambling spirit of the wildcatter and as a result, the number of scattered interests is large. The effect on efficient operation in the field which is brought about by this condition will be mentioned later.

Drilling Practice.

It is a comparatively easy matter to put down a well in the Kevin-Sunburst field. Ten days to two weeks is a good average for completing a well. The cost of an average well runs around $10,000.00, as shown by the records of some of the larger companies.

Drilling practice varies according to the different conditions found. In some areas on the north side a water bearing sand is encountered in the Colorado group, which requires an additional string of casing to be properly shut off, whereas in other parts of the field wells can be drilled to the Ellis without encountering other than surface water, which is usually shut off with a few joints of conductor pipe. In such localities, it is common practice to drill into the black lime immediately above the producing stratas and there land an oil string before drilling in. Such a well will have a short length of conductor pipe and a full length oil string. It is customary to place mud fluid behind the casing to a point above the Sunburst sand in order to kill any flow of gas, or if the gas is to be utilized, it is some times produced through a bradenhead, altho the procedure should not be followed as general practice, without the use of additional casing.

Productive Sands.

The Ellis formation is the principal oil producing formation in the Kevin-Sunburst field. It is encountered at an average depth of 1400 to 1600 feet, and overlies the Madison limestone in this field. The Sunburst sand lies at an average interval of 240 feet above the Ellis. One or more stray sands are often found at varying depths above the Ellis. In some parts of the field water may be encountered in these stray sands of the Colorado group, and showings of gas from such sands have been logged in other wells.

The productive formation is usually termed Ellis sand by the drillers is actually a rotten sandy lime formation. Very few well logs indicate a true sand. This formation varies considerably in thickness throughout the field, 4 to 12 feet being a good average. Most of the production seems to occur near the contact of the Ellis with the Madison lime. Some operators claim to have obtained the production in the Madison lime but this condition seems to be questionable.

Casing Methods.

Gas in varying amounts has been encountered in the Sunburst sand in most of the wells drilled. Volumes varying from a showing of gas up to several million cubic feet have been reported. Initial rock pressures as high as 150 pounds per square inch have been reported, although the average pressure is probably less than 100 pounds. A number of wells have failed to encounter any Sunburst gas, while in a few wells a small amount of oil is found with the gas.

Where it is desired to utilize the Sunburst gas a cave string is usually landed above the Sunburst sand and the gas is produced from a bradenhead between this string and the oil string, after the well has been completed to the Ellis. In cases where the Sunburst gas is not to be utilized, it is a comparatively easy matter to kill the gas by the use of mud fluid behind the oil string. This brings up the question of a uniform system of casing wells throughout the field. The Geological Survey is now considering a uniform system to be recommended to all operators on government land. Such a method would have for its object a better protection of the Sunburst gas than can be accomplished by present methods.

Uniform System.

In brief, it would require (1) a short conductor string to shut off surface water, (2) a cave string landed above the Sunburst and below the lowest sand encountered in the Colorado group, (3) a full length oil string landed in the black lime above the productive formation. The string of pipe landed above the Sunburst is not generally used unless water is found above the Sunburst. It is on this one point that the method suggested differs from common practice. Every sand stratum is a potential water carrier. The fact that a sand may be dry when drilled through should not eliminate the proper protection of productive sands or horizons from the then apparently dry sand. A few wells with the casing pulled and with all sands left unprotected might be the source of flooding a large area of otherwise dry sands. The method outlined is suggested with the idea that gas from the Sunburst sand can readily be drowned out by extraneous water. This gas is of the greatest value in developing and maintaining production, and every effort should be made to prevent the flooding of this sand, or the dissapation of gas into dry sands above. For the latter reason the extra string of pipe previously referred to should always be used when gas is to be produced through a bradenhead.

Some instances have been noted in which lease ownership has been divided, by the sale of royalties and other interests, to such an extent that the actual operator is working under a considerable handicap. With ownership so divided, there is also a tendency to try and "get by" in the cheapest possible manner, all of which leads to poor efficiency in operating.

Water Problems.

Perhaps the greatest obstacle in the way of operators in the Kevin-Sunburst field is the large amount of water found in most of the wells. In some instances it is likely that methods used in drilling and completing the wells may be responsible for a part of the water produced, but it is certain in many wells large amounts of water are present with the oil and of course this water must be produced in order to recover the oil. The long and severe winter weather prevailing in this locality has a direct bearing on the water situation for in summer most of the water produced with the oil will settle out without steaming or other treatment, whereas the present custom is to steam all oil containing more than .2 per cent water in order to effect seperation during the winter months. There are also additional precautions to prevent lines from freezing up which must be resorted to in the coldest weather.

Some points will be taken up here that have a direct bearing on the water situation.

Completion of Wells.

Wells drilled through the Ellis and into the Madison lime will in all probability encounter water in large volume. For this reason, it is recommended that drilling be stopped without going into the Madison. It is claimed by some operators that production has been encountered or increased by drilling into the Madison. Evidence of this point seems to be lacking, and the apparent condition in a few wells might be explained by a broken condition at the particular point of contact of the Ellis and Madison lime.

Swabbing.

The practice of swabbing wells in the Kevin-Sunburst field is not approved by the Geological Survey. This stand is because the pressure relief on the productive formation caused by running the swab has a tendency to bring in the ever menacing water, if it is not already present in the well, or to increase the proportion of water to oil, if the well is already making water with the oil. Experience in other fields has shown that water has a

OPERATING CONDITIONS IN KEVIN-SUNBURST

tendency to cut off oil production due to its ability to move toward a well with less resistance than oil. Continued swabbing of a well is also likely to cause line cutting of the casing or to lossen the casing seat. Although, swabbing is a means of producing a large volume of fluid in a short time, it is probable that the ultimate production of oil from a swabbed well will not be as much as the well would have produced by other methods.

Shooting.

Some very good results have been obtained by shooting wells in the Kevin-Sunburst field. The amount of explosive to be used should be decided by the condition of the formation which it is intended to shoot. If a well comes in a good producer it is usually not advisable to shoot, especially, if the formation is fairly course grained or loose, such as to allow free entrance of fluid to the well. In general, the harder the formation is the heavier should be the shot. Some instances are noted where wells have been brought in for good production which appeared to be dry before shooting. On the other hand, many cases are in evidence where shooting has not materially increased production. Some good success has been obtained by giving wells a series of small shots and cleaning out after each shot. This method is recommended if there is danger of collapsing the casing due to proximity of casing to the shooting point. There is always danger of collapsing casing if the fluid column in a well which is to be shot extends into the casing.

Bottom Hole Plugging.

A few instances have been reported in which attempts at bottom hole plugging were undertaken for the purpose of excluding water while allowing the production of oil. While the results reported were not successful it is hoped that further attempts of this kind will be carried out. In this connection the following suggestions are offered:

A plug should be started in the bottom of the hole or lower part of the productive formation. Plugging should be conducted in stages of only a few inches at a time and careful production tests should be made after each stage to determine the effectiveness of the work done. It is desirable that accurate records be kept of the amount of hole filled by each stage of the plug so that this information may be compared with the log of the well as the work progresses.

Plugging Material.

For wells which have not been shot, a fairly effective plugging material can be prepared by bundling together short lengths of burnt wire line, these bundles to be tamped in the hole by tools. Probably the best method of bottom hole plugging, though more expensive than wire line, is the use of cement placed through tubing by means of pumps and held under pressure until set. By this method the depth to the top of the plug can be determined in advance of its actual placement since all cement in excess of the amount required to fill the hole up to the bottom of the tubing will be washed out of the well by the subsequent circulation of water through the tubing. This method of plugging will fill a cavity of any shape to a predetermined level. A cement plug can also be placed by a dump bailer. However, the exact amount of hole to be plugged off can not be known in advance. Moreover, if there is any movement of fluid in the vicinity of the plug, setting of the cement will be interfered with. Any beneficial results which might be obtained by bottom hole plugging should justify operators in doing further work along this line.

Formation of Emulsion.

The character of the Kevin-Sunburst oil is such that emulsions are rather difficult to break during the colder weather. A certain amount of emulsion should be expected where water is produced with this oil. It is, however, probable that the formation of a considerable amount of emulsion could be prevented by careful attention to the pumping of wells. In a desire to obtain the greatest possible amount of oil from a well it is a common practice to overdo the matter. After the fluid has been lowered in a well to a level where the working valve "pounds the fluid," this churning action of the pump is responsible for the formation of emulsion.

It is suggested that operators make a practice of experimenting on the pumping of each individual well. In this connection, it is necessary to keep accurate records of the production of both oil and water. It may be found that a shorter pumping period each day may produce the same amount of oil that could be obtained by continuous pumping, and the formation of emulsion could be correspondingly decreased. Agitation of the oil by gas also cuts or emulsifies the oil, especially, when water is present.

Preparing Oil for Pipe Line Runs.

During the summer months most of the water produced with the oil settles out after standing 24 hours or less. In fact, the greater part of the separation occurs in the gun-barrel or flow tanks as the fluid is pumped from the wells, the water being drawn off through a siphon near the bottom of the gun barrel. In some cases after the oil has stood in the stock tanks for a day, a bleeder in the bottom of the tank is opened and the water drawn off. The oil is then acceptable to the pipe line companies. In other cases, steaming is resorted to even in warm weather.

Removing Water.

In winter practically all oil which contains any water is steamed. Common practice is to steam the gun barrel tank and draw off as much water as possible there. Further steaming is usually required to effect complete separation. For this purpose oil in the stock tanks is often steamed to 120 degrees F., or in some cases up to 160 degrees, and maintained thereat for several hours. This high temperature is sometimes used in conjunction with chemical treatments in order to put the oil in condition for acceptance by the pipe lines. Samples of Kevin-Sunburst oil recently taken as it comes from the ground show an average gravity of 33.7 degrees, while samples of steamed and treated oil from the same lease had a gravity of 32.6 degrees, A.P.I. With this drop in gravity goes an even greater loss in volume due to the evaporation at this high temperature. Studies made by Bureau of Mines engineers indicate that even where no artificial heat is used, operators in the Salt Creek field sustain a loss of $126,000 annually due to evaporation as calculated in terms of gasoline. Every effort should be made to avoid excessive heating of the oil.

Expects Gravity Basis.

Judging from the practice followed in other fields it is not unreasonable to expect that the sale of oil in the Kevin-Sunburst field may be placed on a gravity basis. If this system should go into effect it would be worth considerable effort to maintain the several points lost by steaming and evaporation.

In this connection, vapor tight tankage would be of great value. (Government Bulletins on this subject are available. B. M. Bulletin 200, and various Bureaus of Mines technical papers).

Abandonment of Wells.

It seems proper here to take up the matter of abandonment methods. Since most wells drilled in Kevin-Sunburst field encounter water at one or more depths, the importance of proper methods of abandoning can not be over estimated. The objects to aim at in abandoning wells in this field are: To prevent the migration of water, oil or gas from any sand or formation to any other sand or formation. In other words, to effectively and permanently confine all, water, oil or gas to the sand or zone in which they occur. Further than this any sand or sandstone encountered in a well should be regarded as a potential water carrier, and proper care should be taken to insure protection of the productive formations should any supposedly dry sand subsequently become water bearing. The Geological Survey requires that all wells abandoned on government land be plugged in accordance with the above mentioned requirements.

A typical case will be assumed in which a well has been drilled to the top of the Madison lime without finding commercial production although a show of oil and gas will be assumed in the Ellis. A small volume of gas will be assumed in the Sunburst. Three stray sands, each dry, will be assumed to overlie the Sunburst and water in the Ellis formation rising to a level of 300 feet below the surface. An effective method of abandonment for this well would be about as follows:

1. Kill all movement of fluid in the Ellis due to gas pressure or other cause. It has been found that an effective way to accomplish this is by the use of burnt wire line bundled together and cut into short lengths. This wire line when tamped with the tools to a point above the productive zone usually effects a temporary shut off of the water. The water should be bailed down after tamping the wire line and after several hours a bailer test run to ascertain if the water has been shut off. If there is no rise noted of the water level, 10 sacks of neat cement should be carefully mixed and placed on top of the wire line to form a permanent seal above the Ellis. The well could then be filled with heavy mud to the surface after which the casing would be removed, and additional mud then be placed in the hole, and a short length of pipe left at the surface for a marker. It has been found that it is useless to place cement in a well while there is any agitation of oil, gas or water below the cement. In such instances, it invariably fails to set in a solid mass. For this reason, it is necessary to kill all movement or flow of water before cementing.

Conclusion.

In conclusion the following points are emphasized:

1. The gas found in the Sunburst

(Continued on Next Page)

GREAT FALLS GAS MAN FORSEES EARLY CONSTRUCTION OF GAS LINE TO CITY

Paper prepared by A. H. Sikes, General Manager, Great Falls Gas Company:

The natural gas industry in Montana and the Rocky Mountain region is still in its infancy and a great future lies before us in this field.

The principal states served with natural gas in this region are Wyoming and Montana, Colorado has some natural gas but it is just being developed and is still in the experimental stages.

In Wyoming there are seven communities which are enjoying the benefits of natural gas.

Nine Towns Have Gas.

In Montana the following communities have natural gas service, Baker, Billings, Glendive, Havre, Shelby, Wilbaux, Miles City, Terry, and Ismay. The natural gas industry in Montana has barely started and the development of a large system to supply the principal communities of the state is in the promotion stage yet.

Two systems have been developed in Montana that cannot be called small as they serve a number of communities.

One of these systems is the Northwest Public Service Company of Wibaux, Montana. Its system is comprised of 165 miles of pipelines and 4 pumping stations supplying Miles City, Terry, Ismay, Glendive and Wibaux, Montana and Beach, N. D. with annual sales of 3 billion feet.

Another of these systems is the one which supplies Billings and several other communities. This source of gas for Billings is drawn from the Wyoming fields.

It has been shown that the natural gas business in Montana has been barely touched. A great future lays before this state in the development of large systems to supply the cities and towns with this wonderful fuel.

Sees Bright Future

There are extensive known gas fields in Montana with a rather large daily capacity. Before a very large natural gas system can be developed, it is necessary to exploit other fields and increase the size of productive area in the known fields. More wells must be drilled in the future, hundreds of miles of pipe line built, distribution systems built and others enlarged so as to build up a great natural gas system that Montana will have in the future. Montana has just started the development of a natural gas industry and a very bright future lays before us in the development of this business.

With the development of a natural gas system in Montana more industries will be brought into the state, the present industries will increase the oil productions by the use of this wonderful fuel. More people will come to Montana with the advent of new industries and new business institutions will be opened in various cities of the state. This means better prosperity for those who are already in business in Montana and this is something in which we are all interested. Not only will it increase the prosperity of the state, it will also make it a better place to live as we will be rid of the smoke and dirt caused by the use of other fuels. Thousands of dollars will be saved annually by the business men of our communities by the abatement of smoke caused by other fuels.

Gas for Great Falls.

Montana has a very bright future before and Great Falls and other cities will reap untold benefits from the advent of natural gas.

The piping of natural gas to Great Falls has been in the minds of the citizens of Great Falls for many years. Periodically some promoter either with a small gas well, or with the hopes of one, usually the latter case, has obtained publicity in the papers and for a time the people's hopes have been raised only to be disappointed in the end. The recurrence of such incidents has led many to believe that they never will enjoy the benefits of natural gas.

As is usual, however, in large business transactions the people who are really doing the work and have the money and capacity to promote large industires do the least talking, and such are the facts in the matter of the transmission of gas to Great Falls.

Extensive Known Fields.

There are extensive known gas fields within 100 to 150 miles of Great Falls in which wells producing 11½ million to 20 million cubic feet per day by actual pitot tube test have been brought in. Competent engineers and geologists have investigated the fields and have made favorable reports. It remains for the fields to be drill tested for area to prove the engineers' assumption before the pipe lines can be financed, This drill testing is now fairly assured.

The cost of transmission lines of sufficient capacity to serve Great Falls is approximately $20,000.00 per mile, including compressor stations and regulator stations. The size of pipe required will probably be from 12 inches to 16 inches. Routes which have been surveyed do not cross any insurmountable obstacles and the cost of laying pipe will be normal.

Quality of Gas.

Tests of gas in the available fields show the following results:

Methane	72% to 92%
Ethane	5% to 10%
Hydrogen Sulfide	None
B. T. U.	950 to 1000

Great Falls possesses a peculiarly favorably market for natural gas which can be divided into two main classes, viz:

City Distribution
Anaconda Copper Mining Company

The load of the Anaconda Copper Mining Company would amount to an average of six million cubic feet per day, or over two billion cubic feet per year and the load factor by months would probably be 90 per cent.

The City distribution on a basis of 100 per cent saturation would be very nearly the same amount but the load factor would be lower. It is estimated that the peak day of the year will be 2½ times the average daily load of the year, and on this assumption the total peak load day will be about 21 million cubic feet. There should be wells available on the lines with a capacity of 50 million to 60 million cubic feet daily flow to assure regular service in the coldest weather.

A detailed survey of the possible market follows:

Industrial Establishments	Cu. Ft.
Great Falls Tribune	5,000,000
Riverside Machine Co.	1,000,000
Andy McLean Foundry	1,000,000
Great Falls Meat Co.	15,000,000
Great Falls Iron Works	4,000,000
C. M. & St. P. Shops	500,000
Great Northern Shops	150,000,000
G. F. Brick & Tile Co.	60,000,000
Sunburst Refinery	31,000,000
Northern Creamery	10,000,000
Idowell Creamery Co.	1,000,000
Stephens-Fuller Pro. Co.	1,500,000
Robert Swain—Springs	225,000
National Laundry	15,000,000
Ideal Laundry	7,500,000
Cascade Laundry	4,000,000
Great Falls Steam Laundry	3,000,000
Schools	37,000,000
Office Buildings	48,250,000
Hotels	178,000,000
Hospitals	14,500,000
Club Buildings	9,500,000
Public Buildings	22,000,000
Restaurants	10,000,000
Apartment Houses	678,000,000
Garages	35,000,000
Bakeries	25,000,000
Commission Houses	15,000,000
Dwellings	567,480,000
Black Eagle	25,000,000
Other classes	54,050,000

Gas in these amounts will justify a pipe line and it can be sold at a

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Operating Conditions

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sand is an important asset to the field. Special care should be taken to protect this gas, from possible flooding or from dissapating into dry sands or porus formations, Additional casing may be required for this purpose.

2. The production of some water can be prevented by care in finishing where drilling into the Madison lime is avoided.

3. Formation of emulsion may be diminished by eliminating unnecessary pumping of wells.

4. Further work along the line of bottom hole plugging is thought to be justified.

5. The use of vapor tight tankage effects a large saving of oil, especially, where the oil is to be steamed. The temperature to which the oil is heated should not exceed the minimum point at which effective separation of the oil and water can be obtained. Heat should not be maintained after the desired results have been accomplished.

6. The proper abandonment of wells is of the utmost importance. In this work it is essential to protect all productive formations so that supposedly dry sands will be prevented from subsequently causing damage in the event they should become water bearing.

In closing, the writer wishes to express appreciation of the work being done by the Rocky Mountain Oil and Gas Association in the state of Montana, also to the operators in the Kevin-Sunburst for their cooperation with the work of the Geological Survey. Operators are invited to call upon engineers of the Survey for assistance in their field problems. The Survey is willing to give any assistance possible in such cases.

SAVING OF MILLIONS OF DOLLARS WILL BE EFFECTED BY USE OF ELECTRIC POWER FOR DRILLING AND PUMPING IN KEVIN-SUNBURST

Dorsey Hager, geologist, and operator, figures that there are between 7,000 and 8,000 locations in the present proven area of Kevin-Sunburst field.

Frank Scotten figures a saving of $1,000 per well through electric operation.

That means a saving in the ultimate development of the field of from $7,000,000 to $8,000,000.

A saving of one thousand dollars per well will be effected by the installation of electric power for drilling and pumping operations in Kevin-Sunburst field, according to Frank Scotten, manager of the Montana Power company, who spoke before the Saturday session of the association. Mr. Scotten announced that his company is making a survey of the north field and will probably run its lines to the field, making this saving possible.

Mr. Scotten said, in part:

The application of electric power to the drilling of oil wells and the pumping of oil is not new, but has experienced considerable development during the past few years. The slowness of its development appears to be in selling the idea. The driller and the producer must be sold on the proposition, and must be convinced of two things. First, that his company will profit by the change; and second, that his field men who use the equipment can continue to satisfactorily perform all of the various operations necessary in oil field work in accordance with the usual practice.

G. W. Taylor of the General Electric Company, says: "The oil fuel consumption for steam engine pumping is from three to fifteen barrels per well per day, depending on the depth of the well, the pumping speed, and other local conditions, for instance, in Texas, the average is ten to twelve barrels." "When such wells are electrified, all of this oil fuel can be added to net production, and this, it will be appreciated, is no small gain."

Will Increase Production.

It is only recently that oil men have begun to realize the amount of time, and consequently of production, lost due to avoidable shutdowns in pumping operations, engine and boiler troubles, reversing clutch trouble, gas shortage, water shortage, freezing, rod breakage and valve and cup troubles caused by vibration and jerking motion are all greatly reduced, and some entirely eliminated by the electric drive. A case is cited in Kansas where by a change to electric operation, the daily production was increased by 15 percent.

Effect Large Saving.

A considerable saving is also shown by electrical operation over steam, and without going into details, will quote a few cases only. One California Company showed a saving of $2775.00 per well per annum, pumping 68 beam wells, another with 14 wells per annum, pumping 68 wells, another with 14 wells showed a saving of $1915.00 per well per annum, another with 8 wells showed a saving of $752.00 per well per annum. A British Company in India showed a saving of 22 percent on 12 wells, another California Company a saving of 63 percent in pumping operating expense, and several cases are quoted where, in the case of small production wells, electrical operation has enabled a profit to be shown, where a loss was previously shown by steam operation.

Cheaper Than Oil Fuel.

Electric power at prevailing costs is cheaper than oil fuel. The same can be said of gas where it has a commercial value. In the case of electric power there is no consumption when idle, no time lost, or fuel used in raising steam, and no pipe losses due to leaky valves and pipes, and no boiler repairs. In the case of electric power it is merely a case of throwing the switch. Transmission losses are very low and remain fixed during the life of the equipment.

The cost of boiler feed water, or gas engine jacket water, usually runs high in most fields because of its scarcity, and is usually hard on boilers. This expense is entirely eliminated with motor operation. Repair costs on electric equipment will not run over 1 percent to 12 percent per year. There is also greater safety of operation. Explosions are eliminated, accidents are fewer, control is simple, steadier motion and cleaner surroundings.

Cost Per Day.

The estimated current consumption per well is estimated to be from 100 to 200 K. W. H. per day per well, or a cost of $1.25 to $2.50 power per well per day. A figure which I doubt can be equalled by any other form of power, and the installation first cost is considerably less than steam or gas.

Make Field Survey.

In regard to the Kevin-Sunburst Field, The Montana Power company made a preliminary survey of the field about fifteen months ago, and at that time the field did not look very promising to us, and no action other than a preliminary report was taken, and I think Oil Operators were not very enthusiastic as to the possibilities of the field.

Since that time, however, there has been drilled in the field about 375 producing wells of varying capacity, and the field has assumed proportions that make it a prospective source of business to the Power Company, and a matter that requires looking into very carefully. In fact, we are now making a second survey of the field, and will have a complete report on conditions and prospective business before the first of the year.

Whether the Power Company will construct the necessary lines to serve this field depends on the result of this report, and the decision of the Company Officials.

Save $1,000 Per Well.

In our preliminary studies we have determined that a saving of about $1,000.00 per well can be made in the drilling operation alone with the application of electric power. This in itself would have amounted to about $375,000.00 in the past fifteen months in the Kevin Field, which is, I think, an item well worth considering on the part of the operators.

Just a word about the Montana Power Company. We will generate and distribute this year about 1,200,000,000 K. W. H. of Electric energy in the State, being the sixth or seventh largest output of companies in the Unitd States.

This is sent out of our Generating Plants over 2300 miles of high tension line serving seventy-five cities and towns in the State, three of which are located here.

Great Falls Gas Man

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price rendering it economically available for every operation requiring heat from the largest mill to the smallest cottage.

This great industry in the northwest is in its infancy and the next few years will see the expenditures of millions of dollars in its development. We are approaching the age of gas when the science of chemistry will be paramount. Natural and artificial gas will be used for practically all heating operations at a utilization efficiency of about 85 per cent in place of 15 to 40 per cent with average conditions of use of hard fuels and the present loss of millions of dollars yearly through the wastes of bi-products will be an occurance of the past.

TAX PROBLEMS OF MONTANA OIL INDUSTRY DEMAND CAREFUL STUDY BY EVERY OIL MAN

Twenty four cents on every dollar's worth of oil produced in Montana at the present time is paid, directly or indirectly, to the county, state and federal governments in the form of taxes, William B. Finlay, expert and public accountant, told the convention of the Rocky Mountain Oil and Gas association's Montana chapter in an address Saturday morning. Computing the total of tax levies against prices now paid for crude oil, the combined levies amount to 40 cents a barrel, he stated.

Mr. Finlay reviewed at length the tax situation affecting the oil industry and asserted that the remedy needed is the application of old-fashioned common sense. Taking up in sequence taxation problems confronting oil operations in Montana, Mr. Finlay said in part:

"First in point of importance, are the problems outgrowing from the Montana net proceeds tax law. The net proceeds tax is essentially a county tax, primarily a metal mining tax law, unsuitable for taxation of oil producers. Section 3, article 12 of the constitution of Montana, reenacted as section 2088 of the revised codes of 1921, provides for the assessment of the net proceeds of mines.

"Unless mining property has a surface value or has been purchased from the United States government at some set price, it is not assessed by the county assessor. If mining operations are carried on, the net proceeds are reported to and are certified by the state board of equalization to the county treasurer and are assessed at the county rate on the basis of 100 per cent of their value. This is the only type of property that is assessed at 100 per cent.

"Automobiles, household furniture, etc., are assessed at 20 per cent; livestock, and merchandise at 33 1-3 per cent; land, surface rights, mining machinery and supplies at 30 per cent, and, money and credits at 7 per cent; but you may retain the undeveloped mining property for years by paying little or no tax. However, when you get production, your gross proceeds for each year are reduced by the outlays for new machinery and the actual expenses of operation to a net proceeds basis, and then, you begin to know you are paying taxes.

"Our chief trouble with this net proceeds tax law comes about through the ease with which its provisions may be misinterpreted. Conceived as a law in the days when ownership was confined chiefly to one mine, it presented very little difficulty in administration. As mines were gradually consolidated under one ownership, it was customary to make the returns of operations embracing all of the mining activities so that the costs for outlay and actual mining and conversion expenses of an unprofitable property were deducted from the proceeds of a more lucrative mine, and no harm came to the operator.

"Oil Well a Mine"

"Lately .there has been a tendency to construe the provision of this law so as to make each mine a separate entity for the purpose of the return and assessment, regardless of the fact that one or more mines were owned and operated by the same company or individual. Then when the oil business rose to prominence in this state, precedent in the case of the Mid-Northern Oil company vs. Walker produced the theory that:

" 'Oil is a mineral and an oil well is a mine.'

"This casual wording of the court was taken up very seriously and it was once ruled that every oil well must be reported on a separate basis. Later, this was modified so that a mine is now considered to be a lease. Neither of these bases is practical for reporting from oil producers' accounts.

"On either basis, most certain confusion will result. Where two or more contiguous leases are held and operated, we are likely to have a situation wherein an operator might spend $50,000 in drilling dry holes on one lease while on a more promising adjoining lease he might expend $30,000 and get $200,000 production.

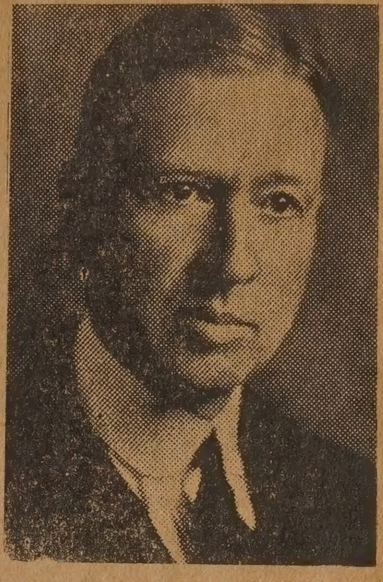
"Granted the tax rate is 50 mills and the taxpayer is not allowed the $50,000 for drilling dry holes, we will have him paying $8,500 county tax, whereas if he were permitted to deduct his legitimate development expenses in drilling the dry hole he would pay only $6,000 tax. On the one hand he is caught by the hazards of the business and on the other by a tax of $2,500 on the $50,000 that he lost.

"I want to tell you that my own personal opinion is that this cannot possibly stand as an equitable measure. Either the law will have to be amended to allow the oil men their proper deductions or else we are going to have to adopt some alternative of our own whereby we can consolidate all of the leases into one property and get our proper deductions in that way.

Decision Brought Crisis in Royalty Relations.

"Second, the same net proceeds tax has got us into trouble in another way, that is, in connection with the royalties we pay to the title holder of royalty. In the case of the Northern Pacific vs. Musselshell county, decided in our supreme court last July, we find that the court definitely decided that the operator is the owner of the net proceeds and that the state board exceeded its authority in deducting royalties paid by the operators.

"Now unless you have a specific clause in your contract with the royalty holders, you are going to have to pay a net proceed tax on all the royalty owners' shares of the net proceeds; a mighty dark outlook for the oil business when you consider that in some cases your ownership of the proceeds is limited to 43 3-4 per cent and lower. From an accounting standpoint, I am seriously concerned and alarmed at the outlook.



WILLIAM B. FINLAY, C. P. A.
Mr. Finlay is one of the foremost authorities on Montana tax problems as effecting the oil industry,.. His paper was one of the outstanding educational features of the program.

Accounting Difficult.

"It not only means paying out real money for others, but it means a lot of bookkeeping in case there are adjustments with the royalty owners or provisions in future contracts with respect to the payment and reimbursement of these taxes. Surely, all future contracts must contain terms for division of this tax responsibility. I cannot see why you should pay a county tax for all these royalty holders any more than you would pay my county tax or all the county taxes of your neighbors in your block.

"Taking the proportions and figures we had awhile ago and assuming that out of the $170,000 you paid $50,000 royalties, then you would be paying, at the 50 mill rate, $2,500 of somebody else's taxes. It means that on every oil settlement account, the oil producer must have a statement of all the amounts paid to royalty owners. It entails extra work for the refiner or other purchaser and more work and more accounting for you.

Montana Taxing Oil Industry Heavily.

"I find, third, that the state of Montana is collecting a 2 per cent production tax and the Montana corporation license tax, which latter tax applies to incorporated companies only. Now, on state lands, Montana gets a 12 1-2 per cent royalty its 2 per cent production tax, its 2 cents a gallon distributors' tax, and its 1 per cent license tax on corporations, while the county gets

TAX PROBLEMS OF MONTANA OIL INDUSTRY

its tax on the net proceeds; a formidable array of revenues. In doing so, there is no depletion allowed in the case of the net proceeds or the license taxes.

"It is my opinion, however, that depletion is a proper deduction for the purposes of the Montana corporation license tax and this is one of the questions that I believe must eventually be tested out in the courts or the law amended so as to make depletion a specific allowance. It may be argued that in the production of oil and gas we are taking of the resources of the commonwealth of Montana, resources which cannot be replaced or renewed and that it is right that these resources be taxed and taxed heavily.

"No one will deny the importance of these mineral deposits in the economy of the state, but there have been sacrifices already made to reduce these to private ownership, some of them more than commensurating for the property acquired. The products are largely consumed within the state and its citizens thereby secure the benefits of these deposits to that extent a somewhat satisfactory condition which we would be loth to give up for those barren former undeveloped areas we thought were cursed for some cause unknown.

Phases of Federal Taxation.

"Discussion of these taxes in relation to oil producers' accounts would not be complete unless we referred to the federal taxes and returns required by law. These are chiefly the income tax, the capital stock tax and the information returns. For the income tax you may report on the basis of any fiscal year ending on the last day of any month, such as, for instance November 30. Barring a few minor disallowances such as gifts or donations, in income returns, the principal disallowance is that of income taxes paid for previous years. Otherwise, your net income is generally the taxable net income after you have taken depletion and depreciation on such capital sum as you are allowed by the revenue act.

"The tax is then 1-8 of your income when it is in excess of $25,250 a year, and one-eighth of the excess above $2,000 when it is less than $25,000, on the corporate basis and at the varying rates of the individual classification. Dividends from domestic incorporated companies are not taxed to the individual at normal rates, but are taxed along with other income above $10,000 at the sur-tax rates, which may and seldom do, amount to 40 per cent of the net income in excess of the exemption.

If Montana's oil industry is going to grow and prosper, the lawmakers and the people in general must be better informed about the problems of the industry and must know about the unfair taxes now imposed upon its various branches.

Here is a paper prepared by an accountant of high professional standing, who has no prejudice in the matter. He points out the trouble with Montana taxation methods as applied to the industry.

Mr. Finlay discusses income tax, also a common sore to those engaged in the oil business. This article merits the perusal of every person interested in oil and the welfare of the State of Montana.

"Inasmuch as I am going to describe discovery revaluations presently, I will not advert to that now except to say that in computing your income tax you are subject to a certain proportion of an allowance for depletion based on discovery revaluations. This, however, is of some little disadvantage for capital stock tax purposes, for, if you establish a discovery revaluation, you cannot escape the capital stock tax of $1 per full $1,000 of fair value in excess of $5,000 assessed to all corporations, syndicates or associations doing business through a board of directors or trustees. Under this category many common law trusts or syndicates must pay the capital stock tax as well as the income tax. We must remember that congress is now about to engage in its regular and customary amusement of passing an income tax law—another simplified one, perhaps, so we do not want to spend to much time discussing the present simplified tax law.

Must Report Gains.

"Under the information returns you must report all determinable gains in excess of $1,000 paid during each calendar year to individuals as as salary, interest, rent, royalties, etc. Payments for property or similar capital transactions resulting in no income are not required to be reported. This is an important matter and the returns are usually required to be sent on to the commissioner at Washington, D. C.

"In addition to this information return, you are, also, required generally to report on another form all dividends in excess of $500 paid during the year. These are calendar year returns and should not be based on your fiscal year accounting.

"The government gives the oil producer, along with the mine operator, three particular options to establish a consistent accounting as a basis for income tax. Once you have established a basis you cannot change without permission secured from the commissioner of internal revenue. I allude to the 'capital vs. expense' basis of distributing outlay, to the 'accrual vs. the cash' basis of reporting receipts and expenditures and to the 'cost' or 'cost or market, which ever is lower' basis allowed for valuing inventories.

Important Problems.

"And now we have a sort of speculative abstract proposition, which we will term valuation, depletion, depreciation and realization. The object of all business activities is profits. The realization of a service charge is rent for the use of the capital you employ. After you have provided for the integrity of your capital investment together with any accumulations of profits which you have added to insure adequate working capital, you will have a realized unemcumbered operating surplus subject to dividends.

"You might have other classes of surplus such as a paid-in surplus or an appropriation, contingent reserve and an appreciated surplus, but none of these would ordinarily be subject to the payment of dividends except to such extent as they are realized or the assets of the business have assumed such character as would allow them to be taken as dividends without affecting the original capital stock investment.

Organization Valuation

"First of the valuations are those acquired at organization. Under our Montana state laws, authorized capital stock may be issued only at par for cash paid, property acquired or services performed in consideration therefor. With the exception of mining operations, other properties are required to be paid in at reasonable values, but for mining properties (and oil wells have been decreed by the courts to be in such category) any arbitrary valuation may be set by the board of directors in purchasing mines or mining property from the vendors and capital stock issued therefor shall be fully paid stock.

"There has been some criticism recently of organization expenses paid from the sale of capital stock and I believe one of our highly esteemed jurists has delivered an opinion extrajudicially from the bench to the effect that moneys paid in for capital stock constitute a trust fund and are not subject to the payment of expenses to influence other investors and to secure other additional sums.

Entitled to Returns.

"Theoretically, this is a commendable position, but from the oil producer's standpoint and as it affects the oil producer's accounts, I am more inclined to sympathize with the practical difficulties facing the oil producer than I am to indulge in any mere aesthetic. The investor going into these oil propositions is usually one of the finest type of sportsmen that I have ever met and I know how he is personally regarded by the oil men and how the majority of the producers who look to this capital for their operations try to protect this sportsman/ investor and give him the largest possible returns for his risks.

"If we were to apply the proposition along the lines suggested by this eminent jurist, we would prevent the collection of a combined capital. However, there are ways to overcome, technically, these objections. Our state laws are designed to further and promote the mining industry and give to the directors the power to issue capital stock for any arbitrary value of mines, as previously stated. One technical way to accumulate this capital and pay the expenses of organization therefrom, is to execute contracts between the venders and the board of directors whereby the entire authorized capital with the exception of the incorporators' shares may be issued to the vendor and his nominees in exchange for their property.

"The vendor may then place so much of the capital as is to be sold to secure working capital in the hands of a trustee to be sold and the net proceeds of the sales shall be turned in to the corporation as a paid in surplus. Thus, you will have eliminated all organization costs outside of the corporation's books. Syndicates might handle the matter in a similar way. I can see no possible objection to this manner of handling the situation provided, of course, that no misrepresentations are sent through the mails nor sales made upon the basis of provable misstatements.

Valuation of Shares

"The valuation of leases thus set

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MID-CONTINENT BANKER WRITES OF THE WORTH OF LOANS TO OIL COMPANIES

Unable to attend the Oil & Gas Association meeting in Great Falls, Mr. R. P. Brewer, chairman of the board of the First National Bank of Tulsa, Oklahoma, one of the greatest financial institutions of the Mid-Continent, wrote his regrets to Secretary Brittan and the association, saying:

My Dear Mr. Brittan:

You don't know how very much I regret the mix up we are having attending the Rocky Mountain Oil and Gas Association meeting in your city at this time.

When I received your first letter of invitation I was just leaving for a trip to Old Mexico, and felt that I could get back home in time to attend this meeting myself; I arrived home the latter part of November, and matters arose here which absolutely precluded my filling the engagement, but one of our Vice Presidents, Mr. L. B. Jackson, and by the way one of the good speakers of this section of the country and a lawyer and an oil man,—agreed to take my place, leaving here the 28th of November; he had a case set in Washington for the 2nd. and felt sure it would be handled promptly, and that he could leave that night, arriving in Great Falls on the 4th.

Only yesterday we have word from him that he is delayed and cannot possibly attend this meeting. This is the plain truth about the whole matter, and I offer my sincere apology.

I sincerely hope you will give me ample time the next time you meet, and I will give you my faithful promise that I shall be only too glad to be on your program the next time—if you should so desire.

I particularly wanted to meet the men composing your organization out in the Northwest, because I feel that oil men should fraternize more in the future than they have in the past, and that it so doing we can to a large extent eliminate some of the unfavorable comments that people who are unacquainted with the oil business make about us. I have always taken the position that the "Doctor Cooks" have advertised the oil game to the general public; while those who are in the oil business and are honest and good men, have been too busy making money and taking care of their profits to enlighten the general public much as to their business.

I have a firm conviction that if the oil busines was advertised and talked about, instead of letting the promoters advertise the "oil game", the general public would realize that we have a great basic industry here that needs not only the active good will but the financial support of the general public. It takes a nation to back the oil business just as it takes a nation to back the agricultural interests; and until this fact is thoroughly understood by the general public, the oil business will not be sufficiently financed.

We have suffered from legislation similar to the packers, mostly

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Tax Problems

(Continued from Previous Page)

upon the books may suggest to you the possibility of controversy with the bureau of internal revenue in computing the income and capital stock taxes. Of course it goes without saying we cannot blow both hot and cold at the same time and that there are advantages and disadvantges in large valuations set up in this mnner. I am quite positive that the vendor receiving stock in the average corporation would not be required to return it at any such valuation for income tax purposes, granted he had acquired the property for a nominal sum and received a million dollars for it in the stock of a new corporation.

"There would be no taxable net income to him from this transaction unless the stock received in exchange therefor had a readily realizable market value. On the other hand the corporation would be justified in proposing to the revenue department depletion on the full value of the stock paid therefor, unless the question of discovery revaluations enters as an element.

"In enumerating the deductions which are allowed to corporations under section 234, of the revenue act of 1924, you will not find discovery revaluation mentioned as a basis for depletion, but the allowance is to be made under rules and regulations prescribed by the commissioner of internal revenue. However, back in the fore part of the law under section 204, discovery revaluation is provided for as a basis for depletion.

"A discovery revaluation insures to the benefit of any owner, lessor, joint operator or lessee who acquires title to unproved leases prior to the sinking of discovery wells upon surrounding areas closer than 1,320 feet of his drilling site. If you discover or participate in the discovery of oil or gas in commercial quantities resulting in an enhanced value disproportionate to what you originally paid for your equity, you and your lessors at interest, or vice versa, may each value your equity in a square area of 160 acres regardless of private boundaries with the mouth of the discovery well as the center, at a fair market value not greater than its value in fee simple, assuming a sale wherein there were a willing purchaser and a willing seller.

"Your land and the well may be so located as to give you but a fractional portion of a square 160 acres but it is desirable that you revalue such portion for the extra depletion which the law permits you to have as balm for the hazards to which you as an industry are subject.

Tax Accounting.

"I do not think we can help but feel impressed with the fact that the oil producers' accounting is pretty much of a question of 'tax' accounting. If we were not faced with so many tax regulations' oil producers' accounts would be quite a simple matter. But, so long as it has become a fixed governmental policy to inquire into and regulate the conduct of individuals in their business matters and affairs, we are forced to do all this accounting for tax purposes and we cannot help ourselves.

Four Cents Tax Per Gallon.

"I have made some very careful estimates with the assistance of operators, refiners and distributors and have found that the various taxes that are paid directly and indirectly to the federal, state and county governments from oil production, amount to at least 24 cents on every dollar's worth of oil produced or 40 cents a barrel at the present time, or, in terms of gasoline, including the distributors' tax of 2 cents a gallon, 4 cents a gallon of gasoline bought by the consumer; 16 per cent or one-sixth of the filling station sales price.

"This enormous tax burden reminds me of a trip I made following the snowstorm we had last September. The roads were dangerously slippery and I was driving along cautiously when I came across a couple of the fraternity parked in a big mudhole alongside the road. I could see where they had begun slipping from the crown of the road some 200 feet or more where they slid off and where they had made one supreme effort to jump the ditch and get out on the open prarie. I stopped to inquire if I might help them, but was told that we might both get in and that they would wait for a truck or caterpillar to come along and pull them out.

"I can see in this incident the straight, high crowned road leading on to business success and profits with the oil producer driving on to his goal; I can see the road getting slippery from the clouds of tax laws and regulations; I can see the operator slipping—ever slipping—and, finally, I can see him in the ditch of business ruin. I can tell you now that it is going to take the big old fashioned truck of common sense to get him out and on the road again and it's going to have to be clearer tax weather again, if he is going to travel far on the road of business profits.

Reforms Needed.

"Less taxes, less annoyance, less investigation, or the government is going to wake up some fine morning and find nothing left to tax. I have no all powerful panacea to offer as a cure-all for these various tax maladies that afflict the oil producer nor any that will simplify the oil producer's accounts. I can only see many years of careful, honest study ahead both by well disposed government officials and the producors themselves. There exists no better medium for the exchange of ideas and the promotion of reforms than this association which brings us here today.

"Perhaps some tax and accounting committee of this association will take up these various menacing tax matters that we face today and by the presentation of facts and figures induce our legislators and administrative officers to recede from some of these unreasonable burdens which have been forced upon the industry. Besides this, it is well that this association keep the public constantly informed of the great share of taxes that you as an industry are paying toward the upkeep and welfare of the commonwealth."

GREAT NORTHERN RAILROAD WILL USE ALL FUEL OIL KEVIN-SUNBURST OIL FIELD CAN PRODUCE, WITHIN REASON -- E. F. FLYNN

By E. F. FLYNN.

"The Great Northern Railway is a large consumer of Montana oil, oil burners now being operated on passenger trains from Wolf Point to Seattle and on freight trains from Wolf Point over the mountains. It was after the northern Montana oil field had been developed into something near the present proportions that the Great Northern installed oil burning locomotives, a fuel problem thus being solved for the company, and as evidence that the Great Northern intends to continue the use of oil for fuel purposes, may be considered the installation last August of four of the largest oil burning locomotives in the world on the Kalispell division.

"There are at present 309 oil burning locomotives in use by the Great Northern, of which 105 operate in Montana.

Need More Fuel Oil.

"The Great Northern is endeavoring to foster and develop the industry in the state of Montana as much as possible, and uses all the fuel oil produced in the state, and would take more if it were available. Due, however, to the uncertainty of supply and the price of oil for use in our engines, the Great Northern has now equipped its power for burning as fuel, both coal and oil alternately, the change from one to the other under this arrangement being very easily and readily made. The oil industry should eventually become one of the largest in the state of Montana.

First Development in 1900.

"Although there was some drilling in Montana as long ago as 1900, the first commercial success was in the discovery in 1904 of natural gas on the Glendive or Cedar Creek anticline in Dawson County in the eastern part of the state, and the piping of the gas to Glendive. Commercial quantities of gas were secured later in other localities, but production was on a small scale.

"Petroleum in commercial quantity was first discovered in 1915, at Elk Basin on the line between the state of Wyoming and Carbon County, Montana. The field is a good producer, but is generally considered part of the Wyoming field. The oil is derived from the Frontier group of sands and the upper Cretaceous series.

Cat Creek Discovery.

"Following the discovery of oil in Devils Basin in northern Musselshell County, in 1919, the Cat Creek field was opened up in 1920 and 1921 in Fergus County in the central part of the state. In 1921 the Soap Creek pool was discovered in Big Horn County. At the close of 1920 the total production of the state was about 6000 barrels a day. The production in 1922 was 2,449,000 barrels for the year.

"So far as known, the prospective and producing sands of Montana are similar to those of Wyoming and Alberta, so that a bright future may be expected for Montana as an oil producing state.

E. F. FLYNN

Mr. Flynn is vice president and general counsel of the Great Northern Railway Company, in charge of Public Relations. His assurances as to the attitude of his company toward Kevin-Sunburst oil development with regard to the consumption of fuel oil was one of the high points of the convention.

Kevin-Sunburst.

"One of the most interesting fields in North America was discovered early in 1922, near the towns of Sunburst and Kevin, Toole County, Montana. This field produces oil from the Jurassic beds, which heretofore have been of but little importance as oil producers, and promises to be the largest single oil pool, in area extent opened on this continent. Attention was called to this field early in 1922, but the developments of the summer and fall showed its possibilities.

Shipments of Oil.

From the time the Kevin-Sunburst field opened in 1922 to the latter part of July, 1925, shipments of oil out of Kevin and Sunburst on the Great Northern reached the 6,000 carload mark. The 6,000 carloads did not include anything but refined products and fuel oil. Crude oil was not included and these figures did not give the amount of oil run through pipe lines from the field. Shipments during July averaged 140 to 175 carloads a week.

Carload shipments of crude oil and petroleum products out of Sunburst and Kevin on the Great Northern from June 1 to August 25th exceeded shipments of the previous three months by virtually 100 per cent and totaled three times the amount shipped out in June, July and August of 1924. Outbound shipments of crude oil and petroleum products from June 1 to August 26th, 1925, totaled 1,770 carloads compared with 700 carloads during the three months previous to June first.

Discovery Well.

The first well in the Sunburst field was drilled in sec. 16, T. 35 N. R. 3 W, by the Gordon Campbell-Kevin Syndicate No. 1, Mar. 14, 1922. Oil was found at 1770 ft. in the basal Ellis formation of Jurassic age. The well was reported as good for 100 to 1000 bbl. but developments prove it good for 5 to 10 bbl. of 30 deg. gravity oil.

Sunburst Well.

The second well, in sec. 34, T. 36 N. R 2 W, was completed June 5, 1922, by the Sunburst Oil and Gas Co. This well produced 100 bbl. of 36 deg. oil, at a depth of 1545 ft., in the basal Kootenai formation of Cretaceous age, and augmented the boom of the field. The active entrance of the Ohio Oil Co. into the field, June, 1922, started a vigorous development campaign. One of the important wells is the California-Morton well in sec. 13, T. 34, R2W, completed in the Ellis sand at a depth of 1373 ft., which extended the field 9 mi. south of the Sunburst discovery well. Completion of

(Continued on Next Page)

Mid-Continent

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because the politicians could be against us and could not be checked up by their constituents. On the other hand, the promoters had probably sold their constituents some worthless stock, and they had lost in the venture as active supporters of those who were fighting our legitimate industries.

It has been my experience as a banker that loans made to legitimate oil companies have always proven the most liquid loans any bank could give; and I think all bankers would have the same experience if they limited their loans, and their customers limit their investments to the legitimate oil concerns. The banding together of associations for the good of the industry, cannot help but further the industry; and I want to say to you that you have my warm personal support, and my best wishes for the success of your association.

With kindest personal regards, I am,

Yours very truly,
R. P. BREWER.

Mr. Walter F. Brittan,
Secretary, Rocky Mountain Oil
and Gas Association,
Great Falls, Montana.

GREAT NORTHERN RAILROAD WILL USE

(Continued from Previous Page)

the Ohio-Berg well in sec. 6, T. 32 R1W, 9 miles south of the Morton well, as a 7,000,000 ft. gasser, has opened possibility 18 miles south of the northernmost wells.

Sketch of Field.

The market for northern Montana oil is vast. It can be shipped to the Pacific Coast and will supply Washington, Oregon, Idaho, Montana, North Dakota, and Minnesota, as well as northwest Canada.

The outstanding facts of this field are:

1. Discovered March 14, 1922, by the Gordon well.

2. Main boom caused by discovery of oil on Sunburst dome, June 5, 1922; this well induced the large oil companies to enter the field.

2. Oil is found in the Kootenai beds of basal Cretaceous age and in the basal Ellis beds of Jurassic age

4. Depth to the Kootenai beds range from 1250 to 1550 ft.: depths to the Ellis range from 1350 to 1800 ft.

5. Production ranges in the Kootenai from 20 to 100 bbl. per day production in the Ellis ranges from 20 to 450 bbl. per day.

6. Oil is 29 deg. to 34 deg. Be; in Ellis horizon, 35 deg. to 38 deg. in Kootenai horizon.

7. Possible oil-bearing area, 212 square miles.

8. Range on structure contours 2250 to 1650 feet; 600 ft. height.

9. One township already largely proved oil bearing.

10. Twenty-nine producing wells have a total production of 2200 bbl. per day at average of 75 bbl.; 30 wells are being drilled. A heavy drilling campaign is planned for 1923.

11. Pipe-line facilities already furnished by Illinois Pipe-Line Co.

12. Market vast; does not compete with other fields.

13. Economic conditions favor operations, because of railroad facilities near field, fair roads, gas and oil fuel available, generally open winters, water available from reservoirs and by lines to neighboring sources, cost of wells fairly low.

14. Large companies operating in field insure intense development program.

Is Series of Pools.

The foregoing summary shows conditions as they existed in February, 1923, with the conclusion that developments in the Sunburst dome justified the assumption that it was not one big pool, but consisted of several areas closely connected and highly productive in part, such a condition calling for very careful study and for development campaigns safeguarded by all available technical information, a field of great potentiality having been developed, oil to the value of several hundred millions of dollars should be extracted from this area over a period of years.

Points to the Folds.

The occurrence of oil in this great dome has special significance for other low-dip folds in Montana. There are other folds known as the Sweetgrass arch, but none of them of the magnitude of the Sunburst dome. The Cat Creek field in Fergus County is 200 miles southeast. Other domes between these two fields offer possibilities as general geological conditions are similar over the intervening area.

Twenty years ago crude oil was refined primarily to produce kerosene oil, which was then practically the only commodity which gave the crude commercial value. It is hard to believe that such a short time ago gasoline was an unwelcome by-product, the disposal of which was the bane of the refiners' existence.

Within two decades we have seen kerosene almost universally replaced as an illuminant by electricity, and in the same period the development of the automotive engine has made gasoline the most prized of all the derivatives of petroleum. Thus the typical modern American mode of transportation has made possible a great American industry.

The producing and proved area in the United States now totals 3,244,581 acres, from which the present (July, 1925) daily recovery is 2,153,000 barrels. The area in which oil may yet be found totals slightly over one billion one hundred million (1,100,000,000) acres, while the geologically unfavorable area totals 827,790,000 acres. The total assets of the petroleum industry in 1913 were $1,136,718,000, in 1923 they were upwards of $9,000,000,000. Production of crude oil in the United States in 1913 was 248,446,000 barrels; in 1923 it was 735,000,000. In 1913 there were 40,000 miles of pipe line; in 1923 there were 75,000. Gasoline refined in the United States in 1913 was 1,500,000,000; in 1923 it was 7,555,000,000.

The development of a modern oil field is in no country a poor man's job, but an idea of what it means elsewhere may be gathered from the industry's experience that before an adequate return on investments in most of the foreign oil fields has been realized, the minimum expenditure has frequently been $25,000,000, and in certain of them double that amount.

Mr. Flynn then discussed the development of the cracking process as applied to motor fuel availibility and quoted from the recent report of the Committee of Eleven which made a survey of the oil resources of the nation. Continuing, he said:

The petroleum industry lives, so to speak, amid ever-changing scenes. Considering past experience, it is not impossible that in the future, through inventive genius in chemistry and mechanics, more efficient motors and generators may be developed that will utilize sources of energy other than gasoline. Such a discovery might cause gasoline to be eclipsed as a major product, just as kerosine was relegated by electricity to a minor position.

It may be claimed for the American petroleum industry that it has displayed conspicuous foresight, initiative and resource in the past, and in the fact of an enormously increasing demand has made petroleum products more easily available and at a cheaper price than in any country in the world. The widespread consumption of the products has been due to their low cost. The price has produced alike the demand and the product to meet the demand, and this factor will continue to create both the market and the requirements of the future, for the resources will ultimately be drawn upon and utilized under the incentive of price.

The success of any industry depends upon progress and expansion--progress in the art of producing and manufacturing, and expansion in finding and making markets, and this is especially true of the oil industry, for without the scientific progress that has been made in recent years in discovering new oil deposits and in increasing the yield of all important gasoline from a barrel of crude oil, the oil industry would have fallen far short of the demands that have been made upon it.

The oil business has three peculiarities. First the margins are narrow; the cost of crude material represents about 80 per cent of the gross values after refining. Second the oil industry is the victim of radical price fluctuations, and these changes are so characteristic of the business that it may be a long time before that condition is overcome. Third there is a rapid turnover. And all of these make it important in the oil business to even up the curve of profit and loss.

Most of the refineries have a different way of arriving at their relative costs of refined products. With a fluctuating crude price and about 60 different products fluctuating in price unevenly, relative costs over a series of products according to some formula. Probably the commonest rule is to accept fuel oil as having an arbitrary value of say 60 or 70 per cent of the posted price of crude. The cost of making other products is then figured relatively. The nature of crude and the relative volume of refined products per barrel of crude have much to do with cost figures.

In Conclusion Mr. Flynn said:

"The Great Northern Railway has purchased very heavily of Montana oil and its products, for use on its lines, and our taking the fuel oil and paying the market price enables the producers to refine more oil than they could do if they were unable to sell the fuel oil.

"The Great Northern has felt that the oil development of Montana was a benefit to the state and thereby benefited every resident of the state, and with this in view, the railroad has in every case promoted in a legitimate way the development of the industry in Montana.

RASMUSSON'S TALK ON INCOME TAX IS HIGHLY COMMENDED BY BROOKS

"One of the finest talks I have ever heard on national taxation," said Ex-Governor B. B. Brooks of Wyoming following the address by C. A. Rasmusson, Collector of Internal Revenue, of Montana. Mr. Rasmusson discussed the new income tax law and devoted considerable time to the discovery-depletion clause which matter has been disposed of by the Ways and Means Committee of Congress in a manner satisfactory to the oil industry at large.

BROOKS COMMENDS LOCAL ASSOCIATION AND DECLARES PEOPLE OF MONTANA DO NOT APPRECIATE WORTH OF OIL INDUSTRY

A message of commendation and assurance of cooperation was given the Montana association by Honorable B. B. Brooks, former governor of Wyoming, and president of the Rocky Mountain Mountain Oil & Gas association, at the Saturday afternoon session.

M. Brooks expressed great admiration for the Montana chapter and pointed out that the people of Montana little realize the import of the development of Kevin-Sunburst field.

"In Casper we are able to compete with the rest of the world 'n oil prices because of our low fuel cost," he stated.

"You should be able to do the same thing here for already you have a proven area in the Kevin-Sunburst field four times as great as the acreage of our Salt Creek field in Wyoming."

Worthy of Support.

"You have uncovered perhaps the greatest undevloped oil acreage in this land," Mr. Brooks declared. "If the business men of your cities could only realize what this will mean to Montana they would back you every minute.

"To the oil men I say, have faith in this industry for your children will still find oil contributing to the comfort and happiness of this state."

Mr. Brooks pointed out that high fuel costs and lack of adequate water supply were usually responsible for excessive cost of refined petroleum products.

He declared that establishment of a refinery here will provide a real market for the natural gas being found north and west of Great Falls and that the gas could be piped here at such a low cost that competition with eastern refineries on the open market would be possible. Water is found here in abundance, he pointed out.

"I was scheduled to speak here on 'How the Oil Industry Affected Our Neighbors in Wyoming.'" Mr. Brooks said as a preliminary to his real talk. "I do not want to talk on this subject any more than to give you a few examples which may be of benefit to you in Montana.

Must Create Market.

"In Wyoming we found we had to create a market for our crude oil. You will have to do the same in Montana. The real solution appears to be the establishment of a refinery so that the petroleum product needs of your neighbors to the north, west and east may be cared for."

The taxation question is extremely vital to the oil industry, Mr. Brooks pointed out. He praised those who have succeeded in retaining the original discovery clause in the new revenue bill which is to come before congress Monday.

"Practcally all of the dome structures in the country have been tested," he pointed out. "No doubt there is still much undiscovered oil but it will be up to the wildcatter to find it. He must have some means of being rewarded if he does find oil.

"A strong organization also is necessary to insure success of the oil industry and I must congratulate Montana on the rapid strides already made. Your organization must recognize the producers, transporters, refiners and marketers. There must be no jealousy among them or among the Rocky mountain states, all of which are now producing oil."

KEVIN-SUNBURST FIELD WILL PRODUCE 150 MILLION BARRELS OF OIL, AVERS DORSEY HAGER

"There is no reason why within the next few years, we should not develop a production of certainly 25,000 barrels, perhaps 50,000 barrels per day and maintain our production for years to come," Dorsey Hager told the Oil & Gas Association at the Saturday session.

"The Sunburst field alone has locations for 8,000 wells which should produce close to 150,000,000 barrels of oil in the future; a fine field and in time a very profitable one. I hope deeper sands will be found there but at present such a hope is not any too promising."

WALTER F. BRITTAN

Mr. Brittan has built up the membership of this association from the nucleus of four, nine months ago, to its present standing and hopes to add from 2,000 to 3,000 members during the year 1926.

Mr. Hager discussed the petroleum development of Northwestern states, dealing with the Dakotas, Wyoming, Montana, Oregon and Washington. In dealing with Montana he said:

"Regarding the Sweetgrass Arch, I do believe that wherever one can find a fold or conditions in the Colorado shales that would justify drilling, tests should be started. Tests on top of the Arch can reach the Ellis Horizon in most cases at from depths of 1500 to 2500 feet. Enough is known from the tests on the Arch to indicate that there is oil in the Ellis horizon, and it only remains to find the right spot or spots and production should be obtained. The price of drilling on the Arch will not be very high as wells of 2000 to 2500 feet can be drilled there at a cost of not over $25,000.00 and perhaps less, and a smaller production would be more profitable there than off the Arch. I confidently look in time, for several of prolific fields to be opened between Great Falls and Shelby, and perhaps extensions of the Sunburst field to the Southeast, where tests start in Colorado beds

Gas Area Important.

"Drilling for oil off the Arch has uncovered some gas possibilities and other gas areas may be found. However, it sems to me that someone is overlooking a splendid gas prospect in the area North of Shelby to the Troy Sweetgrass well. The holes can be drilled for $7,000.00 or $8,000.00 and flows from 1,000,000 to 12,000,000 cu. ft. per day have been found. The Kootenae sands are from 20 to 30 feet thick in these wells. Someday that gas area w'll furnish

KEVIN-SUNBURST FIELD WILL PRODUCE

Great Falls with gas. The area is large enough for a 30 year supply at least.

"Prospecting for new fields will have to be carried on by using every scientific device possible, and by blocking out tracts of land, and drilling those tracts with contributions from numerous sources on the old "wild-cat" plan. I do not think that diamond core drilling here will be of much assistance in determining structure. The Eotvos torsion balance used on the Gulf Coast and also in California will also be of little assistance here, and the detonating methods employed on the Gulf Coast will also be of little value. Those methods are particularly applied to sharply marked folds and a type of folding that as yet we have not found on the Arch.

Electrical Device.

"I do think, however, that in time a new electrical device, something on the principle of the electrical system used by the Swedish Geological Survey, which now outline orebodies by determining differences of potential, may be applied to our work in Montana, but as yet this system has not been employed successfully in finding oil, although I think the technique will soon be developed so that it will be of value.

"We need not fool ourselves, gentlemen, we need not go further than the facts now warrant, to know that we have commercial oil of importance in Montana and that we are in position to profit from it especially when we obtain a higher price for our oil which we anticipate. As oil operators you are interested in finding oil, and you go where it can be found. We all are devoted to Montana but our affections must not influence our judgments too strongly. We need new oil fields and must find them."

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Homestake Oil Co.,
Lewistown

Vice-President- - - A. Judson Findley
Western Petroleum Exploration Co.
Shelby

Vice-President - - - M. C. Henderson
Sunburst Refining Co.
Great Falls

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Vice-President - - - - C. H. Brown
Arro Oil & Refining Co.
Lewistown

Treasurer - - - - - A. D. Becker
Homestake Oil Co.
Great Falls

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Donald Campbell, Producer - Billings
A. Judson Findley, Producer - Shelby
L. B. O'Neil, Refiner - - - Sunburst
A. E. O'Brien, Refiner - - Lewistown
M. C. Henderson, Refiner - Great Falls
C. H. Brown, Marketer - - Lewistown
C. W. Landsrud, Marketer - Great Falls
H. Earl Clack, Marketer - - - Havre
Henry Sample, Marketer - - Glendive
R. J. Coughlin, Marketer - - Scobey
O. I. DeSchon, Publicity - Great Falls

Executive Committee 1926

M. C. Henderson, C. W. Landsrud, A. E. O'Brien, A. J. Findley, O. I. DeSchon and C. H. Brown.

CONVENTION COMMITTEE 1925

Program: Walter F. Brittan, Chairman, D. W. Greenburg, S. S. Ford, Roy E. Ayers, A. J. Findley, M. O. Danford, James A. Johnson.

Entertainment: A. D. Becker, Chairman, O. I. DeSchon.

Finance: M. C. Henderson, Chairman, B. G. Stevenson, W. F. Brittan, W. J. O'Haire.

Publicity: O. I. DeSchon, Chairman, E. H. Cooney, Lee Thurston, A. J. Hazlett, W. W. Cheely, S. E. Peterson, John O'Neil.